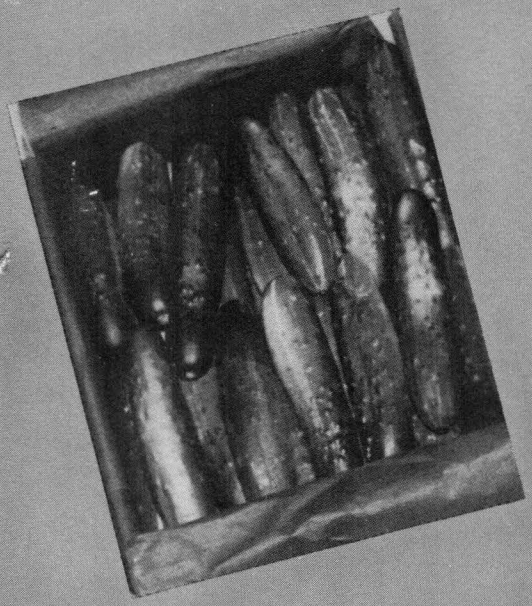
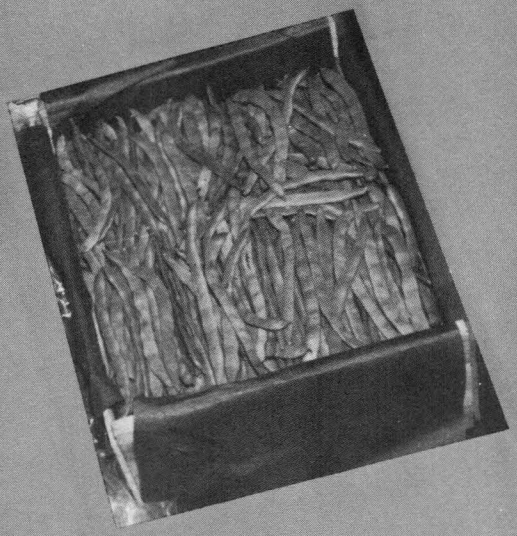


MAINLAND MARKETS FOR HAWAIIAN WINTER VEGETABLES

C. W. PETERS, J. A. MOLLETT, AND WOODROW Y. NAKASHIMA



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C. W. Peters, J. A. Mollett, and Woodrow Y. Nakashima

INTRODUCTION

It has been proposed that Hawaii might develop a new export industry in winter vegetables. This proposal, although not a new one, has aroused much interest recently as a means of development for local diversified farming, particularly in the new areas about to be placed under irrigation. Hawaii possesses climatic advantages for this type of production during the December-April season. It can produce certain vegetables for the West Coast market when mainland production is at a low ebb. Possible export crops that have been suggested include such items as snap beans, cucumbers, eggplant, bell peppers, squash, and tomatoes. These particular commodities have been recommended especially by some of the important dealers on the Coast. This report presents some of the economic aspects that must be considered if serious thought is given to commercial shipments of Hawaiian winter vegetables.

THE PROSPECTIVE MARKET

A substantial West Coast market exists for the six vegetables listed, ranging from about 4 million pounds of eggplant to almost 100 million pounds of tomatoes in the period from December through April (see table 1). Its extent may be judged from the fact that unloads of tomatoes in the Los Angeles, San Francisco, Portland, and Seattle areas in the winter of 1958-59 were 15 times Hawaii's output of tomatoes in all of 1958. During the 1958 winter season unloads of the six selected vegetables in the four major markets on the Pacific Coast were worth 30 million dollars at the wholesale level.

Table 1. Estimated 1958 unloads of certain winter vegetables in major Pacific Coast markets (Los Angeles, San Francisco, Portland, Seattle)[1/]

Month	Snap beans	Cucumbers	Eggplant	Bell peppers	Italian squash	Tomatoes
			1,000 pounds			
January	2,960	1,550	775	3,720	2,592	17,766
February	720	1,425	725	2,760	3,168	18,123
March	1,180	1,300	525	3,760	3,600	15,099
April	2,040	2,425	450	4,080	4,512	23,079
December	3,040	2,225	800	3,460	3,816	24,108
Total	9,940	8,925	3,275	17,780	17,688	98,175

1/ Source of data: Unload reports issued by the Federal-State Market News Service at Los Angeles, San Francisco, Portland, and Seattle.

The market exists but the primary problem is whether Hawaii can compete with other areas for this potentially lucrative trade. Currently, Hawaii finds it difficult at times to meet even the local demand for the six selected vegetables mentioned above. West Coast markets are in great part supplied with winter vegetables from Mexico, Florida, Texas, the Bahamas, and Southern California. Recently, the Bahamas have moved into the position formerly held by Cuba as a source of winter vegetables. The latest type of farm machinery is used on a large scale in these regions. Labor is relatively cheap. Marketing channels are long established and generally well managed.

EFFECT ON LOCAL MARKET

If Hawaii enters the winter vegetable trade on the Mainland, local truck farmers will undoubtedly notice a change in prices received on the Honolulu market. At present, prices of local vegetables tend to be determined by West Coast prices plus ocean freight--if local supplies are inadequate to meet market needs. If local supplies are adequate or more than adequate, then prices are determined solely by local supply and demand conditions. For example, if tomatoes are selling for 15 cents per pound in San Francisco and the freight to Honolulu is 5 cents a pound, then the local price of tomatoes will tend to be around 20 cents per pound. If there is a glut of tomatoes from local production then the price will, of course, go below 20 cents. The severity of the decline in this instance would depend in large part on the extent and duration of the market glut.

If local production expands for an export trade then the price received by local farmers will most likely approximate the West Coast price minus freight. This would mean 15 cents per pound minus 5 cents for freight--only 10 cents a pound. Thus, with no export trade the price received for tomatoes would be 20 cents per pound and with an export trade only 10 cents per pound--a 50 percent drop. This important change occurs as Hawaii changes from a deficit to a surplus position in the production of selected vegetables (see figure 1). In these circumstances, of course, local consumers would benefit considerably through lower prices. Some farmers, however, would find it necessary to cease production of vegetables that are exported. Their unit costs would be far above the lower prices on the local market.

TEST SHIPMENTS

There has been an interest of varying intensity in the possibility of shipping Hawaiian vegetables to the Mainland that has extended over the entire period since the close of World War II. Sporadic trial shipments have been made for both experimental and commercial purposes but there has been no sustained flow of vegetables from Hawaii to the Mainland except for specialty items such as ginger root and lotus root.

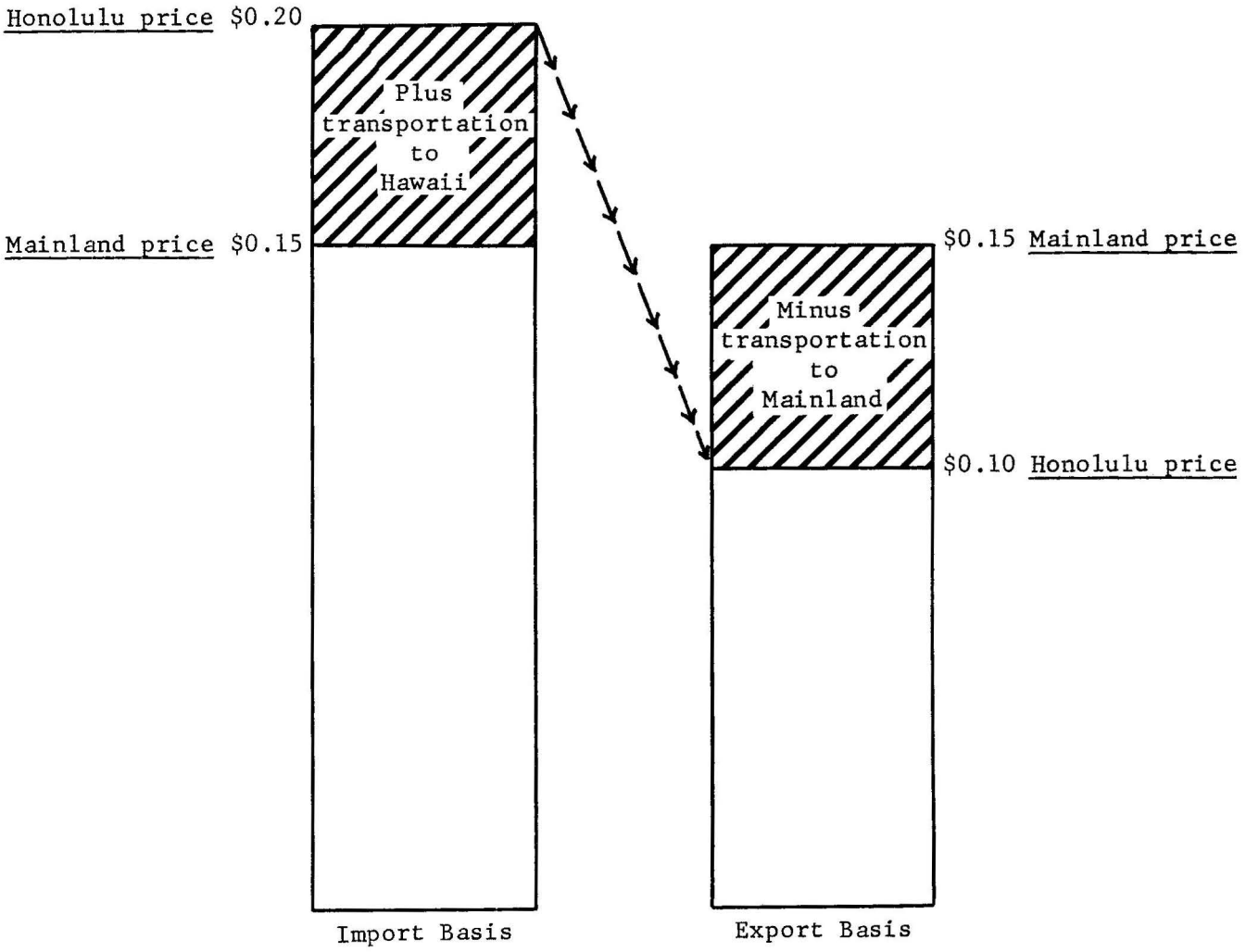

Figure 1. Illustration of probable effect on the Honolulu price of a vegetable as a result of conversion from an import basis to an export basis.

Figure 2. Cucumbers on arrival in San Francisco following boat shipment from Honolulu, January 1960. Cucumbers in lug to the right were waxed.

As a further check on the physical practicability of shipping winter vegetables to the Pacific Coast, three test lots were sent via boat to San Francisco, Oakland, and Portland, respectively, during January and February of 1960. Cucumbers and snap beans were included in these tests. All were packed in standard Los Angeles lugs filled to a 30-pound net on cucumbers and a 20-pound net for beans. In each container a paper liner and a pad were used to protect the contents. Among the 28 lugs of cucumbers shipped there were 10 boxes in which a polyethylene film liner was employed in addition to the paper liner and pad and the cucumbers in 10 boxes were waxed. The waxed cucumbers were divided evenly among boxes in which film was included and those in which only the regular paper packing materials were used. No wax was used with the snap beans but 2 of the 4 lugs of beans shipped did have the film liners.

These test lots of cucumbers and beans were subjected to the required dosage of ethylene dibromide (EDB) as a prelude to clearance under the quarantine regulations affecting outgoing shipments of plant materials. For the sake of convenience the experimental shipments were routed to destination as a part of certain commercial consignments of fresh papayas and pineapples. The vegetables were held in the same chill rooms aboard ship as were used for the fresh fruits. The temperature of these rooms was about 43-47 degrees Fahrenheit. Although the scheduled transit time to San Francisco is 6-7 days and 9-10 days to Portland, the actual elapsed time required for delivery of these test shipments to the consignees ranged from 8 to 12 days.

The inspections of the test shipments after arrival at initial point of sale on the West Coast disclosed the following:

1. Practically no bruising was incurred as a result of the voyage and the handling incidental to loading and unloading.

2. A limited amount of decay (about 5 percent by number) appeared in cucumbers shipped to Portland but no significant decay was evident in either the beans or cucumbers sent to the Bay area.

3. The cucumbers placed on sale after 8 days en route were fairly firm but softness was appearing in those that had been packed for 12 days. Snap beans were still reasonably crisp after 8 days.

4. No damage to the wood LA lugs was noted. Receivers on the West Coast indicated some preference for a wirebound box (1-1/9 bu. capacity). A telescoping type of fiberboard container has also been suggested for Hawaiian vegetables.

5. Polyethylene film liners did not improve the keeping qualities of either beans or cucumbers. More "sweating" or dampness was apparent in those containers where film was used.

6. Waxing of cucumbers may have improved the appearance somewhat but it had no apparent effect on the condition of the vegetable or upon the price received for the commodity.

EFFECT OF QUARANTINE REGULATIONS

The essential regulations that have resulted mostly from fruit fly infestation in Hawaii are a serious obstacle to development of a commercial trade in vegetables with the mainland markets. These regulations operate to restrict exports from the Islands but have little effect on inshipments of fruits and vegetables to the Islands from outside areas, unless they originate in areas that are infested with pests not now found in Hawaii.

At present the treatment required in order to obtain clearance from the quarantine officials is almost a total bar to export shipment of many vegetables. Among the six items that are mentioned above as potential exports, cucumbers and snap beans will consistently undergo the specified treatment process without suffering seriously adverse effects on the keeping qualities of the commodity. Tomatoes will in some cases maintain their quality for a reasonable time after exposure to the approved treatment but eggplant, Italian squash, and bell peppers do not hold up well after being subjected to the vapor heat process that is currently required for these particular commodities.[1/] This tendency to break down rapidly is particularly serious where ocean transportation is contemplated.

1/ More detailed information concerning the quarantine and treatment program may be obtained from the Plant Quarantine Division and the Entomology Research Division of the Agricultural Research Service, U. S. Department of Agriculture, Honolulu, and from the Hawaii Agricultural Experiment Station, University of Hawaii.

Figure 3. Snap beans on arrival in San Francisco following boat shipment from Honolulu, January 1960. A polyethylene liner was added to the lug at the left.

Efforts to devise new and improved treatments and to develop strains of vegetables that withstand fumigation are underway in laboratories supported by the Agricultural Research Service (USDA) and by the Hawaii Agricultural Experiment Station. Until an improved fumigation process and/or new strains of vegetables are perfected, however, it is evident that the quarantine regulations currently effective are a major limiting factor in the development of an export trade in most Hawaiian winter vegetables.

TRANSPORTATION

Assuming a transit time of 8 days for vegetables shipped to San Francisco or Los Angeles by steamship, it is obvious that Hawaii's products are at some disadvantage as compared with those originating in Mexico, Texas, Florida, and even the Bahamas. Refrigerated trucks that operate around the clock are used to transport many winter vegetables from the major producing areas to West Coast markets. Regular weekly steamship service with adequate reefer space is currently available between Hawaii and California but the schedule into the Pacific Northwest does not provide sufficient frequency or speed to transport fresh produce satisfactorily. In these circumstances it would be more logical to tranship Hawaiian perishables from San Francisco to points north by using truck service that is readily available at a relatively low cost.

Figure 4. Cucumbers and snap beans on arrival in Oakland following shipment from Honolulu, January 1960. Cucumbers in the middle lug were waxed and those in the lug to the right were unwaxed but had a polyethylene liner.

On a straight cost basis, Hawaii is not at a serious competitive disadvantage as compared to Florida and the Bahamas when transportation charges alone are considered. Ocean freight plus cartage at both shipping point and destination is estimated at $0.05 per pound for vegetables shipped from Honolulu to California ports. About $0.015 to $0.02 additional cost would be incurred if these commodities are transhipped from San Francisco to Portland, Seattle, and Vancouver by truck.

Air freight to the Pacific Coast may be practicable for winter vegetables where or when the price level is unusually high. At times certain items such as bell peppers would perhaps return a margin of profit after air freight at $0.11 per pound has been absorbed. This special rate of $0.11 per pound was established recently by the airlines on an experimental basis in order to encourage development of this type of traffic between Honolulu and Pacific Coast ports of entry. It has now been formalized as a regular tariff item with the requirement that a 1,000-pound minimum per shipment be observed. Where air freight is used it is obvious that vegetables shipped in this manner should arrive in substantially the same condition as prevailed when they were loaded in Honolulu. Use of packing materials that would be as light in weight as practicable is a particularly important consideration if air freight is used for fresh vegetables. This factor must also be considered where other forms of transportation are employed but qualities such as strength and durability assume greater importance where ocean and land facilities are involved.

COMPARATIVE PRICES AND RETURNS

Under present conditions of production and marketing only bell peppers would show any margin above Honolulu prices if they were exported. This is indicated by a comparison of prices in Honolulu and in San Francisco for the 5-year period, 1955-59 (tables 2 and 3). Such a finding is not unexpected. Until local producers enter the export trade their prices are, in effect, buttressed by a tariff equivalent to ocean freight charges from the Mainland.

The indicated difference in prices received on an export and on a nonexport basis is smallest for bell peppers and eggplant. Bell peppers on a hypothetical export basis had a 6 percent price advantage (16.8 cents per pound compared with 15.9 cents per pound) over the local market; eggplant had a 25 percent price disadvantage (7.4 cents per pound local compared with 5.5 cents on exports). Other vegetables were, in contrast, much more badly placed for export so far as comparative returns are concerned. Snap beans, for example, would have brought 18.1 cents per pound locally but only a net price of 13.6 cents on an export basis. Tomatoes sold locally for 15.1 cents per pound compared with a net return of only 5.8 cents for exports.

Under present conditions of production and marketing--only peppers, eggplant, and snap beans show a positive return over production cost with prices computed on an export basis.

Table 2. Estimated San Francisco prices of certain winter vegetables during the period of 1955-59[1/]

Month	Snap beans	Cucumbers	Eggplant	Bell peppers	Italian squash	Tomatoes
			Cents per pound			
January	25.2	22.8	16.6	26.9	17.7	17.7
February	29.4	18.6	19.4	29.8	21.3	15.7
March	25.9	17.4	18.4	34.1	15.6	19.4
April	24.2	16.9	16.2	32.9	15.0	19.4
December	25.0	16.8	14.0	23.7	15.7	14.7
Season average	25.9	18.5	16.9	29.5	17.1	17.4

1/ Source of data: Price reports issued by the Federal-State Market News Service at San Francisco.

Average monthly prices listed in table 2 are somewhat misleading in that they obscure the shorter term price fluctuations on the wholesale produce markets. Daily and even weekly prices of most fresh produce items vary considerably; with the variations being much more severe in the large markets such as Los Angeles and San Francisco than they are in Portland, Seattle, and Vancouver. A shipper would find it almost impossible to forecast the short-term price movements on most vegetables and to adjust his shipments on this basis, particularly if he were depending on a weekly steamship service for

Table 3. Estimated price relationships for certain Hawaiian vegetables, based on actual or hypothetical sales in San Francisco and in Honolulu, December through April, 1955-59

Prices, costs, and returns	Snap beans	Cucumbers	Eggplant	Bell peppers	Italian squash	Tomatoes
			Cents per pound			
A. San Francisco sales:						
Average wholesale price (table 1)	25.9	18.5	16.9	29.5	17.1	17.4
Less:						
Selling expense 1/	2.6	1.8	1.7	2.9	1.7	1.7
Container 2/	1.7	1.0	1.7	1.8	1.1	1.4
Packing, handling, fumigation, etc.	3.0	3.0	3.0	3.0	3.0	3.5
Transportation 3/	5.0	5.0	5.0	5.0	5.0	5.0
Total	12.3	10.8	11.4	12.7	10.8	11.6
Computed net value of unpacked vegetables, f.o.b. Honolulu	13.6	7.7	5.5	16.8	6.3	5.8
B. Honolulu sales:						
Average wholesale price 4/	23.6	15.9	11.1	21.1	17.9	20.7
Less:						
Selling expense 5/	3.5	2.4	1.7	3.2	2.7	3.1
Containers, packing, handling, etc.	2.0	2.0	2.0	2.0	2.0	2.5
Total	5.5	4.4	3.7	5.2	4.7	5.6
Computed net value of unpacked vegetables, f.o.b. Honolulu	18.1	11.5	7.4	15.9	13.2	15.1
C. Advantage of Honolulu sales	4.5	3.8	1.9	-0.9	6.9	9.3
D. Estimated cost of production, Hawaii 6/	11.2	10.0	4.0	9.8	7.6	7.6

1/ Based on an average of 10 percent for both consignment and direct sales--straight commission rates are 15-20 percent on the Pacific Coast.

2/ Wirebound crates (1-1/9 bu.) except LA lugs for tomatoes.

3/ Includes cartage to and from docks.

4/ Source of data: Reports issued by the Hawaii Cooperative Crop and Livestock Reporting Service.

5/ Based on an average of 15 percent for both consignment and direct sales. Honolulu produce dealers usually receive a commission of 15-20 percent on consignment sales.

6/ Except for Italian squash, the costs listed are based on cost studies conducted by the Department of Agricultural Economics, Hawaii Agricultural Experiment Station. Containers and other packing expenses are not included in these cost estimates.

transportation. It is of interest to note, however, that there is a clear-cut tendency for prices of some items to be higher or lower at certain times in the season. For anyone contemplating the shipment of bell peppers or tomatoes from Hawaii to the Mainland, it is significant that prices of those commodities tend to be higher in March and April.

Returns on the 1960 test shipments to San Francisco and Portland were not good in terms of the prevailing prices in Honolulu at the time. This has been the usual outcome in those cases where commercial produce dealers in Honolulu have from time to time sent trial shipments of winter vegetables to the Pacific Coast. The net amount received for cucumbers shipped in January-February 1960 was about $0.05 per pound f.o.b. Honolulu--the going wholesale price in Honolulu was at least four times that figure. For snap beans the return from the test shipments was equivalent to $0.23 per pound but the Honolulu price at the time was over $0.30 per pound. These price comparisons largely reflect the difference between operating on an export basis and on a protected (net import) basis. They fit logically into an expected pattern.

It is evident that substantial reductions in production costs would be needed if winter vegetables such as cucumbers, Italian squash, and tomatoes were to be successfully exported from Hawaii. Present production methods, which are relatively high in cost, are geared to generally high prices prevailing on a pocket market. Production for export must be geared to lower returns and, inevitably, to the handling of larger volumes. The marketing system through which fresh produce now moves to Hawaii's consumers is definitely not geared to the handling of large quantities of vegetables destined for export. In large part a wholly new marketing mechanism would be needed in order to handle such commodities. Some of the facilities now used in marketing fresh papayas and pineapples on the Mainland might be the nucleus of the marketing system for winter vegetables.

OBSERVATIONS AND HIGHLIGHTS

Whether Hawaii can develop an export trade in winter vegetables hinges mostly on the question, "Can local costs be significantly lowered?" The answer here can be "yes" if Hawaii truck crop farmers become more efficient in both production and marketing and if a way can be found to meet plant quarantine requirements without serious aftereffects on the treated produce. Relatively high land, labor, and water costs make the task of improvement difficult. Furthermore, stringent fumigation procedures required for export crops damage quality and reduce shelf-life of several vegetables with the result that at present only cucumbers and snap beans (of the six suggested export items) consistently withstand the required treatment satisfactorily. It should be remembered that competing areas shipping into the West Coast winter vegetable market generally use large-scale methods of production and marketing, are continually improving methods of cultivation and harvesting, and are using improved seed strains. If Hawaii is to gain a foothold in this market, continuing emphasis must be given to developing and using those strains of vegetables that are resistant to disease and fumigation, heavier yielding, and of high quality. It may be necessary to operate on a much larger scale than at present in order to achieve lower costs. Vegetable farms in Hawaii currently average about 5 acres in size (cropland only).

An indirect but important effect of developing an export trade in winter vegetables would be that local prices of the commodities involved would tend to become much lower. This could lead to difficulties for those truck farmers who have developed their business on the basis of the current market situation. Until exports of winter vegetables reach a sizable level there would likely be a transition period during which the return for a greater output of produce would actually be less than was obtained when only the local market was available. This situation, of course, would be a direct outgrowth of conversion to price determination on an export basis.

If small farmers are to participate successfully in the shipment of winter vegetables to the Mainland, they will need to work together in packing, shipping, and selling their produce in order to achieve efficiency in marketing and to exercise maximum bargaining power in dealing with buyers. Wherever possible, it would be advantageous to sell directly to large-scale retailers on the Mainland in order to hold marketing charges to a minimum. Farmer cooperatives may be one approach to the marketing problem.

Exports from Hawaii would be relatively small in relation to total mainland supply in the early stages. They would exert little influence on mainland prices but much on island prices.

At this time, Hawaii is not even self-sufficient in some of the commodities suggested as potential exports; e.g., tomatoes and bell peppers. These vegetables are sometimes imported from the Mainland during the December-April period when it is proposed that Hawaii send the same vegetables to the Pacific Coast. Obviously, growers should first be able to supply their local market before considering seriously the opening of a mainland outlet.

It is extremely important to produce the kinds and varieties of produce that the mainland markets demand. Export shipments must consist of graded, high-quality produce only, packaged in an acceptable form. These requirements mean that island produce marketings would have to be considerably better and of more consistently high quality than at the present time. It would not be totally unexpected to find that the lower-quality produce might then be unloaded on the Honolulu market.

A major problem in opening up an export trade in vegetables is lack of knowledge of Hawaii's production possibilities and crop costs. This omission in our knowledge may, to some extent, be corrected by the Molokai demonstration farm which is in the process of being established. This farm of about 30 acres, together with related economic investigations, has been financed with an initial appropriation of $51,000 by the State Legislature in order to determine what crops will grow on Molokai and at what cost. This Molokai project can provide only part of the necessary answers. It will not show what economies are feasible from large-scale production. It will provide valuable answers to such problems as what yields we can expect and at what cost. It may be that winter vegetables are not, in existing circumstances, the bright possibility that farmers and others hope for the diversified sector of Hawaii's agriculture. Other important export crops remain, however, and further efforts should be devoted to market development for fresh pineapple, papaya, passion fruit, guava, and macadamia nuts. These crops have distinct possibilities as major export crops for the mainland markets. Except for fresh pineapple, their problem is mainly one of limited market development and high costs associated with small volume. Competition from other areas is less intense for these products than for winter vegetables.